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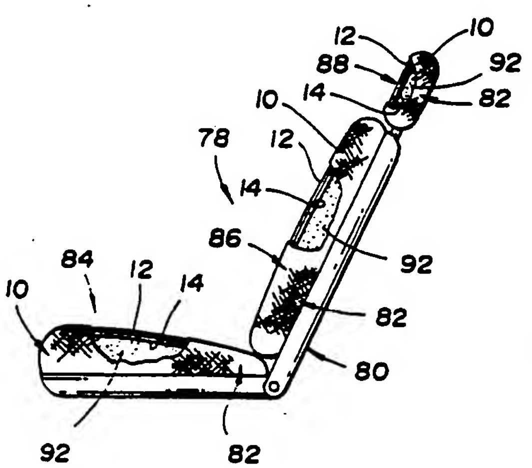

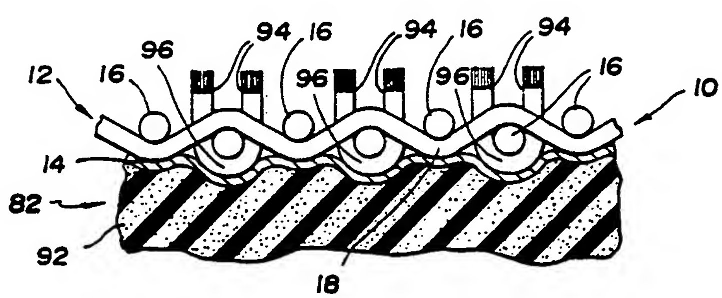

(57) Abstract

A coated cloth (10) includes a breathable porous cloth (12) having a breathable latex foam coating (14) that nevertheless prevents the passage of viscous foamable liquid polyurethane mixtures such that soft open cell polyurethane foam (92) can be formed in direct engagement with the coating without permeating the porous cloth (12). The latex foam coating (14) has a thickness of about .025 to 3.0 millimeters and an open cell structure with about 400 to 600 openings per square millimeter. The coated cloth (10) is made by depositing on the cloth (12) an acrylic latex foam coating (14) which is subsequently dried, optionally crushed to increase the foam density, and finally cured. A soft foamed article covered by the coated cloth has particular utility as a seating component (82) such as a seat cushion (84), a seat back (86) or a headrest (88).

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FOAM COATED CLOTH, METHOD FOR COATING AND FOAM ARTICLE COVERED BY CLOTH

TECHNICAL FIELD

This invention relates to a latex foam coated cloth, to a method for coating the cloth and to a soft foam article covered by the cloth.

BACKGROUND ART

Conventional pour-in-place molding of soft open cell polyurethane foam within a cloth cover has previously been accomplished by providing the cloth cover with an impermeable layer or film that is air tight. The impermeable layer is necessary to prevent the foamable liquid polyurethane mixture poured into the cover from permeating the cloth in a manner that could cause stiffening of the cloth fibers and destroy the aesthetic appearance of the exposed cloth surface. See, for example, prior art United States Patents: 4,247,347 Lischer et al; 4,247,348 Lischer; 4,264,386 Sears, Jr. et al; and 4,287,143 Sears, Jr. et al which each disclose pour-in-place polyurethane molding within a cloth cover having an airtight film which is disclosed as preferably being made from polyvinyl chloride.

While pour-in-place molding of soft open cell soft polyurethane within a cloth cover can be performed as described above utilizing an airtight film, the resultant covered soft foam product is not capable of breathing or permitting the passage of water vapor. This is a disadvantage when the product is to be utilized with seating since the seated person will then experience heat and moisture buildup that results in discomfort.

Other prior art patents noted during an investigation conducted for the present invention include United States Patents: 3,577,554 Parrish et al; 3,714,078 Gordon et al; 4,014,843 Xanthopoulo; 4,208,485 Nahta; 4,325,831 Watson et al; 4,357,428 Watson et al; and 4,417,016 Cline et al.

DISCLOSURE OF INVENTION

One object of the present invention is to provide a foam coated cloth that is breathable so as to permit the passage of gas but whose coating nevertheless prevents the passage of viscous foamable liquid polyurethane mixtures so as to permit open cell soft polyurethane foam molding directly against the cloth coating without permeating the cloth.

In carrying out the above and other objects of the invention, the coated cloth includes a porous cloth that is breathable and a latex foam coating on the cloth. The latex foam coating has a thickness in the range of about .025 to 3.0 millimeters and an open cell structure with about 400 to 600 openings per square millimeter so as to permit the passage of gas such that the coated cloth is breathable while nevertheless preventing the passage of viscous foamable liquid polyurethane mixtures so as to permit open cell soft polyurethane foam molding directly against the cloth coating without permeating the cloth.

Both the lower and upper extremes of the range of openings per unit area as well as the thickness of the foam coating are important in providing a coated cloth that is breathable while nevertheless preventing the passage of viscous foamable liquid polyurethane mixtures. More specifically, if the foam coating has large enough openings so that there are less than about

400 openings per square millimeter, the coated cloth will not prevent the passage of viscous foamable liquid polyurethane mixtures such that open cell soft polyurethane foam cannot be molded directly against the cloth. Furthermore, if the foam coating has small enough openings so that there are more than about 600 openings per square millimeter, the coated cloth will not permit the passage of gas so as to be breathable. Similarly, the foam coating must have a thickness that is at least about .025 millimeters to prevent the passage of viscous foamable liquid polyurethane mixtures and must have a thickness no greater than about 3.0 millimeters to permit the passage of gas so as to be breathable.

Best results are achieved when the latex foam coating is an acrylic copolymer.

Another object of the invention is to provide a method for making the foam coated cloth which is breathable while nevertheless preventing the passage of viscous foamable liquid polyurethane mixtures so as to permit open cell soft polyurethane foam molding directly against the cloth coating without permeating the cloth.

In carrying out the immediately preceding object, the method for making a foam coated cloth is performed by mixing an acrylic copolymer, a pH neutralizer, a stiffener, water and a latex premix with a frothing agent and an aerosol with the ratio by weight of the frothing agent over the aerosol in the range of about 2.3 to 2.85. This mixture is deposited on a porous cloth for foaming as a foam coating having an open cellular structure with about 400 to 600 cells per square millimeter and a thickness in the range of about .025 to 3.0 millimeters such that the coated cloth is

breathable while nevertheless preventing the passage of viscous foamable liquid polyurethane mixtures.

In performing the method, the foam coating is deposited with different thicknesses in the .025 to 3.0 millimeter range depending upon the particular application for which the foam coated cloth is to be utilized. More specifically, the foam coating is deposited with a thickness in the range of about .025 to .25 millimeter for use with free rise foamable liquid polyurethane mixtures and is deposited with a thickness of about .25 to 3.0 millimeters for use in providing overpacking with foamable liquid polyurethane mixtures. When the foam is deposited in the .25 to 3.0 millimeter thickness for use with overpacking, a thickness of about .25 to 1.0 millimeter is sufficient to prevent penetration of the cloth by the liquid polyurethane mixture during the overpacking, while a thickness of about 1.0 to 3.0 millimeters also provides strength to the cloth as well as preventing the liquid polyurethane mixture from penetrating the cloth during the overpacking.

The method is most economically performed on a commercial basis by heating of the deposited foam layer to dry the foam coating.

The foam coating is disclosed in one practice as being crushed such as between rotating rolls to increase the density of the foam coating. This crushed foam coating is then preferably heated to accelerate the curing of the foam. Such processing permits the coated cloth to be manufactured as a generally continuous strip during movement along deposition, drying, crushing, and curing stations.

It is also possible for the foam to be deposited, dried and cured without crushing.

Best results are achieved with a preferred composition of the aqueous acrylic copolymer latex foam mixture. More specifically, the stiffener is preferably an acrylic acid copolymer that is most preferably provided as a gel. Furthermore, the frothing agent is preferably ammonium stearate and the preferred aerosol is disodium n-octadecylsulfosuccinamate.

Another object of the invention is to provide an improved soft foam article with a breathable cover.

In carrying out the immediately proceeding object, the improved soft foam article includes a cover having a porous cloth that is breathable and that has an interior including a latex foam coating having a thickness in the range of about .025 to 3.0 millimeters. The latex foam coating has an open cell structure with about 400 to 600 openings per square millimeter so as to permit the passage of gas such that the coated cloth cover is breathable while nevertheless being impermeable to viscous foamable liquid polyurethane mixtures. An open cell soft polyurethane foam core of the article is molded in situ within the cover in direct engagement with the latex foam coating which prevents the foam core from permeating the porous cloth.

The covered soft foam article of the invention has particular utility for use as a seating component such as a seat cushion, a seat back, a headrest and an armrest and, in such applications, overpacking of the foam core is preferably utilized such that the foam layer is preferably in the .25 to 3.0 millimeter thickness range that functions best with overpacking.

The objects, features and advantages of the present invention are readily apparent from the following detailed description of the best modes for carrying out the invention when taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

FIGURE 1 is a sectional view taken through a coated cloth constructed in accordance with the present invention and made according to the method thereof so as to be breathable while nevertheless preventing the passage of viscous liquid polyurethane foam mixtures;

FIGURE 2 is a plan view of the cloth taken along the direction of line 2-2 in Figure 1;

FIGURE 3 is view that illustrates one practice of the method for making the foam coated cloth in accordance with the invention;

FIGURE 4 is a sectional view similar to Figure 5 showing the cloth prior to a crushing step that increases the density of the foam;

FIGURE 5 is a cross-sectional view taken through a mold in which coated cloth of this invention is located to receive a foamable liquid polyurethane mixture for in situ molding in order to provide the covered soft foam article of this invention;

FIGURE 6 is a partially broken away view illustrating the manner in which the covered soft foam article can be utilized as a seat cushion, a seat back, or a headrest;

FIGURE 7 is a partially broken away view illustrating the manner in which the covered soft foam article can be utilized as an armrest;

FIGURE 8 is an enlarged sectional view illustrating the interface between the molded open cell soft polyurethane foam and the foam coated cloth cover; and

FIGURE 9 is a view similar to Figure 3 but illustrating the processing without any crushing of the foam coating on the cloth.

BEST MODES FOR CARRYING OUT THE INVENTION

As illustrated in Figures 1 and 2 of the drawings, a coated cloth 10 constructed in accordance with the present invention is disclosed as including a porous cloth 12 that is breathable and a latex foam coating 14 on the cloth. As illustrated, the porous cloth 12 includes warp yarn 16 and woof yarn 18 such that there are pores or openings 20 through which the cloth breathes. The latex foam coating 14 on the porous cloth 12 has an average thickness t in the range of about .025 to 3.0 millimeters. Furthermore, the latex foam coating as shown in Figure 2 has an open cell structure with about 400 to 600 cells or openings 22 per square millimeter. These parameters of the latex foam coating 14 permit the passage of gas through the foam openings 22 while nevertheless preventing the passage of viscous foamable liquid polyurethane mixtures which have a viscosity of about 600 to 800 centipoises. More specifically, it is important for the foam coating to have a thickness of at least about .025 millimeters and openings 22 that are small enough so that there are at least about 400 openings per square millimeter in order to prevent the passage of viscous foamable liquid

polyurethane foam mixtures such that open cell soft polyurethane foam can be formed directly against the latex foam coating without permeating the cloth. However, it is also important that the thickness t of the foam coating is not greater than about 3.0 millimeters and that the openings 22 are large enough so that there are no more than about 600 openings per square millimeter so the coated cloth will permit the passage of gas and thus be breathable.

With reference to Figure 3, apparatus 24 is utilized to perform a method for making the foam coated cloth 10 as described above in connection with Figures 1 and 2. More specifically, this apparatus 24 shown in Figure 3 includes a supply roll 26 from which the cloth 12 is unrolled upon rotation in the clockwise direction of arrow 27, a deposition station 28, a drying station 30, a crushing station 32, a curing station 33 and a delivery roll 34 onto which the coated cloth is wound upon rotation in the clockwise direction of arrow 35 after movement as shown in the direction of arrow 36 from the left toward the right through the four stations.

With continuing reference to Figure 3, the deposition station 28 includes an applicator 37 having a mixing chamber 38 in which a suitable mixer 40 provides mixing of components as a mixture 42 that provides the latex foam coating 14. More specifically, this mixture includes an acrylic copolymer, a pH neutralizer, a stiffener, water and a latex premix as well as a frothing agent and an aerosol. Furthermore, the ratio by weight of the frothing agent over the aerosol is in the range of about 2.3 to 2.85 and most preferably about 2.58. The frothing agent is a surfactant that reduces the surface tension so that air is more easily entrained in the mixture by the mixing

action. The aerosol is a weaker surfactant that causes the larger air cells to break into smaller ones and thereby provides air cells of more uniform size as well as providing greater stability so that the mixture can be spread as shown or pumped if necessary. It is important for the ratio of the frothing agent and the aerosol to be in the range described above so as to ensure sufficient frothing without having so much aerosol that the mixture collapses upon the eventual foaming. Applicator 37 has a lower end 44 with an opening for depositing the latex foam mixture 42 on the porous cloth 12 as the cloth is moved from the supply roll 26 at the left toward the right. The deposited mixture 42 of the coated cloth 10' foams to an open cellular structure 14' shown in Figure 4 with about 400 to 600 cells or openings 22 per square millimeter.

The thickness to which the foam coating 12 is deposited in the .025 to 3.0 millimeter range depends upon the application for which the foam coated cloth is to be used. More specifically, the foam coating is normally deposited with a thickness of about .025 to .25 millimeter for use with free rise foamable liquid polyurethane mixtures, while the foam coating is deposited with a thickness of about .25 to 3 millimeters for use in providing overpacking with foamable liquid polyurethane mixtures. When overpacking is to be utilized, deposition of the foam coating with a thickness of about .25 to 1.0 millimeter is sufficient to prevent penetration of the cloth by the liquid polyurethane mixture during the overpacking. Deposition of the foam coating on the cloth with a thickness of about 1.0 to 3.0 millimeters provides strength to the cloth as well as preventing the liquid polyurethane mixture from penetrating the cloth during overpacking.

Subsequent to the deposition of the latex foam mixture 42 onto the porous cloth 12 at the deposition station 28, the foam coated cloth moves through the drying station 30 where a suitable heater 46 is located to heat and provide rapid drying of the foam coating. While the foam coating could be air dried, this heating to provide the drying makes the processing much faster and thus more economical and effective.

Downstream from the drying station 30, the crushing station 32 shown in Figure 3 includes lower and upper crushing rolls 48 and 50 that are respectively rotated clockwise and counterclockwise as shown by arrows 52 and 54. These crushing rolls crush the foam coated cloth to decrease the average foam coating thickness from the initial thickness t' to the final thickness t and thereby increase the density and thus the strength of the foam. The resultant coated cloth is thus strengthened by this crushing. It is possible for the crushing to reduce the foam thickness to as little as about 10% of its original thickness. For some foam compositions which are somewhat elastic, the foam coating thickness may rebound to a certain extent after the crushing step. For other foam compositions which are less elastic, there will be little or no rebound in the thickness. The final thickness t of the foam coating 14 is selected depending upon the application for which the foam coated cloth is to be used as discussed above.

With continuing reference to Figure 3, the curing station 33 preferably includes a heater 56 that heats the crushed open cell foam to accelerate the curing.

With reference to Figure 9, a modified embodiment of the apparatus utilized to perform the

method for making the foam coated cloth 10 is identified by reference numeral 24' and has the same components as the embodiment of Figure 3 except for the fact that there is no crushing station 32 as with the previously described embodiment. Thus, the initial thickness to which the foam layer 14 is deposited will be substantially the same as the final thickness. Otherwise, the processing is the same as the previously described processing and thus need not be repeated.

The stiffener of the latex foam increases the viscosity and is most preferably an acrylic acid copolymer that is a gel, such as sold by the Rohm and Haas Company of Philadelphia, Pennsylvania, United States of America, under the trademark Acrysol ASE-95, which is supplied as an aqueous solution that is acid neutralized to provide the gel before mixing with the other components. Furthermore, the frothing agent utilized is preferably ammonium stearate such as sold by Standard Adhesive & Chemical Company of Dalton, Georgia, United States of America, under the trademark Stanfax 318. One aerosol utilized is disodium n-octadecylsulfosuccinamate.

A specific example of the latex foam mixture utilized is set forth by the following example.

EXAMPLE

Components	Parts by Weight
*Rhoplex E-1011 (acrylic copolymer 30% solid, and H_2O)	200.00
Water	58.3
Premix	
*Tamol 731 (25%) (emulsifier aid)	4.4
TiO2 (white pigment)	5.0
**Acme WW (calcium carbonate filler)	55.0

*Acrysol ASE-95 (stiffener)	0.7
***Stanfax 320(an ammonium stearate frothing agent that is 32% solid)	7.5
****Octosol A-18 (aerosol 34% solid, and H_2O)	2.9
NH 4 NO 3 (25%) (PH Neutralizer)	2.5

*Trademark of the Rohm and Haas Company of Philadelphia, Pennsylvania, United States of America

**Trademark of the ECC American, Inc. of Sandersville, Georgia, United States of America

***Trademark of Standard Adhesive & Chemical Company of Dalton, Georgia, United States of America

****Trademark of Textile Rubber and Chemical Co. of Dalton, Georgia, United States of America

It should be noted that the calcium carbonate filler is merely utilized to provide more volume and thus cost reduction. This filler is a clay powder that is dispersed in the mixture during mixing and can also be provided as a premixed aqueous dispersion which is sold by the previous mentioned ECC American, Inc. of Sandersville, Georgia under the trademark Eccatex 90 and is 68% solids. Also, the latex foam mixture of this example has a viscosity of about 940 centipoises when measured by Brookfield Viscosity, Low Viscosity Formula, Mixer Paddle #3, at 30 revolutions per minute. The density of the resultant latex foam is on the order of about .15 grams per cubic centimeter when air is introduced by the mixing from the atmosphere. Introduction of pressurized air into a closed chamber where the mixing is performed provides a greater porosity and hence a lower density such as about .12 grams per cubic centimeter.

With reference to Figure 5, a pour-in-place mold 58 is illustrated as having a mold member 60 that

defines a mold cavity 62 and as also having a cover 64 illustrated as being supported by a pivotal connection 66 for movement between the open position shown by solid line representation and a closed position where the top of the mold cavity 62 is closed at the phantom line location 67. Mold member 60 is illustrated as including a vacuum housing 68 defining a vacuum chamber 70 that is communicated by passages 72 with the mold cavity 62. Furthermore, the cover 64 is illustrated as having vents 74 that permit the escape of gas generated by the foam reaction during foam molding within the cavity 62 as is hereinafter more fully described.

The coated cloth 10 illustrated in Figures 1 and 2 is placed within the cavity 62 of mold 58 as shown in Figure 5 to make a covered soft foam article in accordance with the present invention. More specifically, the coated cloth 10 is positioned within the mold cavity 62 where it is maintained by a vacuum supplied from the vacuum chamber 70 through the passages 72. It should be noted that, while the coated cloth is breathable as described above, a vacuum drawn to a sufficient extent within the vacuum chamber 70 will maintain the cloth against the surface of the mold cavity 62 since the latex foam coating 14 on the porous cloth 12 does limit the gas flow therethrough to a certain extent. After proper positioning of the coated cloth 10, the vacuum is terminated so the foam molding can proceed.

A viscous foamable liquid polyurethane mixture 76 is supplied into the mold cavity 62 as shown in Figure 5 for foaming by the pour-in-place process. The latex foam coating 14 of the coated cover 10 prevents the viscous foamable liquid polyurethane mixture 76 from permeating the porous cloth 12 and destroying its utility by permeating the cloth yarns and providing

stiffening thereof and by preventing passage through the porous cloth so as to damage its outer exposed surface. Closing of the cover 64 permits the foaming to take place to fill the mold cavity as gas generated during the foaming reaction escapes through the cover vents 74.

With reference to Figure 6, a seat 78 is illustrated as including covered soft foam components that embody the article of the present invention as made by the foam molding described above. More specifically, the seat 78 includes a frame 80 and seating components 82 which embody covered soft foam articles constructed in accordance with the present invention. These seating components 82 include a vehicle seat cushion 84, a vehicle seat back 86, and a vehicle headrest 88. Furthermore, as illustrated in Figure 7, another seating component 82 is illustrated as a vehicle armrest 90 that embodies a covered soft foam article of the present invention. These seating components 82 can function for furniture as well as for vehicle seating.

With combined reference to Figures 6, 7 and 8, each of the seating components 82 embodying the covered soft foam article of the present invention includes the coated cover 10 which, as previously described, includes the porous cloth 12 that is breathable and has an interior including the latex foam coating 14. More specifically, the latex foam coating as previously described is preferably an acrylic copolymer and has a thickness in the range of about .025 to 3.0 millimeters as well as having the open cell structure previously described with about 400 to 600 openings per square millimeter so as to permit the passage of gas such that the cloth cover is breathable while nevertheless being impermeable to viscous foamable liquid polyurethane mixtures such as the mixture 76 previously described in connection with Figure 5. Each component 82 also has an

open cell soft polyurethane foam core 92 molded in situ within the cover. This in situ molding as best illustrated in Figure 8 is with the foam core 92 in direct engagement with the latex foam coating 14 which prevents the foam core from permeating the porous cloth 12. Furthermore, as illustrated, the porous cloth 12 has short tufts 94 secured in pairs by connector yarns 96 that extend around the warp yarn 16.

Overpacking is normally utilized with seating components by introducing more liquid polyurethane mixture than is required to fill the mold by free rise. The overpacking thus provides a greater density of the foam core. As such, the thickness of the foam layer 14 on the coated cloth is preferably about .25 to 3.0 millimeters when utilized with seating components such as the seat cushion 54, seat back 86, headrest 88 and armrest 90 shown in Figures 6 and 7.

While the best modes for carrying out the invention have been described in detail, those familiar with the art to which this invention relates will recognize the various ways of practicing the invention as defined by the following claims.

WHAT IS CLAIMED IS:

1. A coated cloth comprising:
a porous cloth that is breathable; and
a latex foam coating on the cloth, said latex foam coating having a thickness in the range of about .025 to 3.0 millimeters, and the latex foam coating having an open cell structure with about 400 to 600 openings per square millimeter so as to permit the passage of gas such that the coated cloth is breathable while nevertheless preventing the passage of viscous foamable liquid polyurethane mixtures.

2. A coated cloth as in claim 1 wherein the latex foam coating is an acrylic copolymer.

3. A method for making a foam coated cloth comprising:
mixing an acrylic copolymer, a pH neutralizer, a stiffener, water and a latex premix with a frothing agent and an aerosol with the ratio by weight of the frothing agent over the aerosol in the range of about 2.3 to 2.85; and
depositing the mixture on a porous cloth for forming as a foam coating having an open cellular structure with about 400 to 600 cells per square millimeter and a thickness in the range of about .025 to 3.0 millimeters so as to be breathable while nevertheless preventing the passage of viscous foamable liquid polyurethane mixtures.

4. A method for making a foam coated cloth as in claim 3 wherein the foam coating is deposited with a thickness of about .025 to .25 millimeter for use with free rise foamable liquid polyurethane mixtures.

5. A method for making a foam coated cloth as in claim 3 wherein the foam coating is deposited with a thickness of about .25 to 3 millimeters for use in providing overpacking with foamable liquid polyurethane mixtures.

6. A method for making a foam coated cloth as in claim 5 wherein the foam coating is deposited with a thickness of about .25 to 1.0 millimeter to prevent penetration of the cloth by the liquid polyurethane mixture during the overpacking.

7. A method for making a foam coated cloth as in claim 5 wherein the foam coating is deposited with a thickness of about 1.0 to 3.0 millimeters to provide strength to the cloth as well as preventing the liquid polyurethane mixture from penetrating the cloth during the overpacking.

8. A method for making a foam coated cloth as in claim 3 wherein heating is performed to dry the foam coating.

9. A method for making a foam coated cloth as in claim 3 wherein the foam coating is crushed to increase the foam density.

10. A method for making a foam coated cloth as in claim 9 wherein the foam coating is heated to provide drying thereof prior to the crushing.

11. A method for making a foam coated cloth as in claim 9 or 10 wherein the foam coated cloth is crushed between rotating rolls to increase the density of the foam coating.

12. A method for making a foam coated cloth as in claim 3 wherein the coated cloth is heated to cure the foam coating.

13. A method for making a foam coated cloth as in claim 3 wherein the stiffener utilized is an acrylic acid copolymer.

14. A method for making a foam coated cloth as in claim 13 wherein the acrylic acid copolymer is a gel.

15. A method for making a foam coated cloth as in claim 3 wherein a butyl acrylate is mixed with the other components to increase the extent to which the foam coating can be elongated.

16. A method for making a foam coated cloth as in claim 3 wherein the frothing agent utilized is ammonium stearate.

17. A method for making a foam coated cloth as in claim 3 wherein the aerosol utilized is disodium n-octadecylsulfosuccinamate.

18. A method for making a foam coated cloth comprising:

mixing an acrylic copolymer, a pH neutralizer, a stiffener, water and a latex premix with a frothing agent and an aerosol with the ratio by weight of the frothing agent over the aerosol in the range of about 2.3 to 2.85;

depositing the mixture on a porous cloth for foaming to provide a foam coating; and

heating the coated cloth to provide drying of the foam coating as an open cell structure having about 400 to 600 cells per square millimeter and a thickness in the range of about .025 to 3.0 millimeters so as to

be breathable while nevertheless preventing the passage of viscous foamable liquid polyurethane mixtures.

19. A method for making a foam coated cloth as in claim 18 wherein the frothing agent is ammonium stearate and wherein the aerosol utilized is disodium n-octadecylsulfosuccinamate.

20. A covered soft foam article comprising:

a cover including porous cloth that is breathable and that has an interior including a latex foam coating, said latex foam coating having a thickness in the range of about .025 to 3.0 millimeters, and the latex foam coating having an open cell structure with about 400 to 600 openings per square millimeter so as to permit the passage of gas such that the coated cloth cover is breathable while nevertheless being impermeable to viscous foamable liquid polyurethane mixtures; and

an open cell soft polyurethane foam core molded in situ within the cover in direct engagement with the latex foam coating which prevents the foam core from permeating the porous cloth.

21. A seating component comprising:

a cover including a porous cloth that is breathable and that has an interior including a latex foam coating, said latex foam coating having a thickness in the range of about .25 to 3.0 millimeters, and the latex foam coating having an open cell structure with about 400 to 600 openings per square millimeter so as to permit the passage of gas such that the coated cloth cover is breathable while nevertheless being impermeable to viscous foamable liquid polyurethane mixtures; and

an open cell soft polyurethane foam core molded in situ within the cover in direct engagement with the latex foam coating which prevents the foam core from permeating the porous cloth.

22. A seating component as in claim 21 which is selected from the group consisting of a seat cushion, a seat back, a headrest and an armrest.

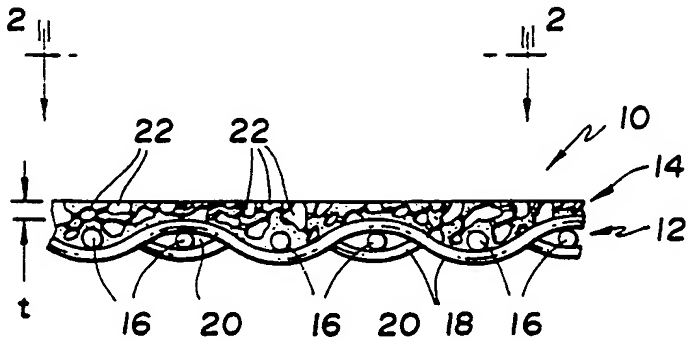

Fig. 1

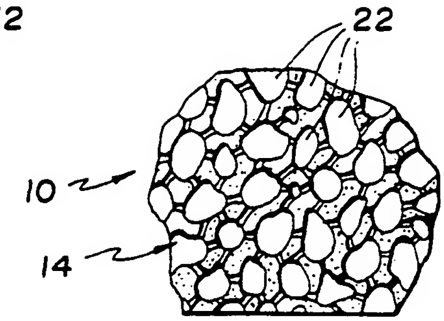

Fig. 2

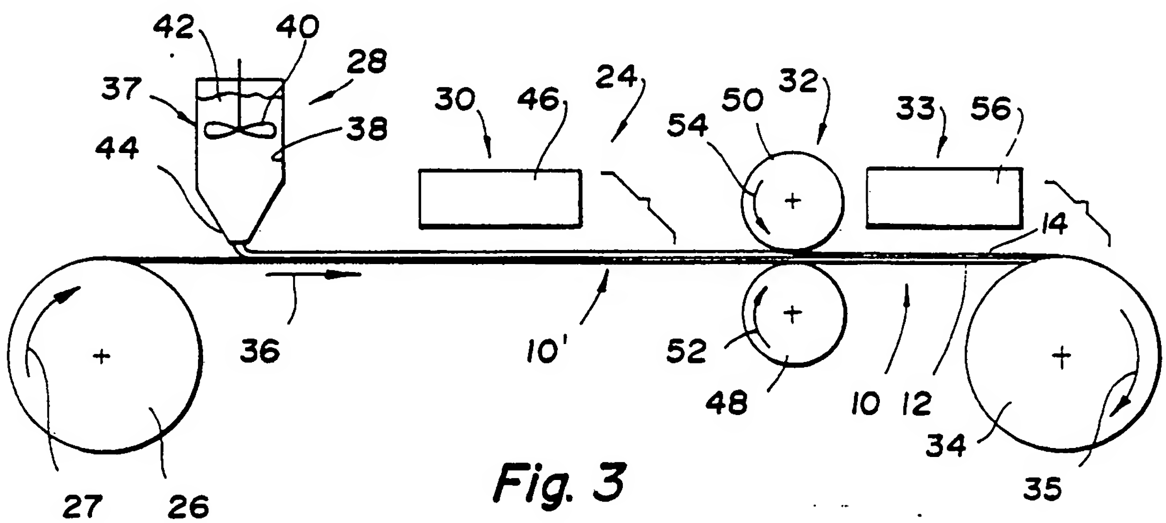

Fig. 3

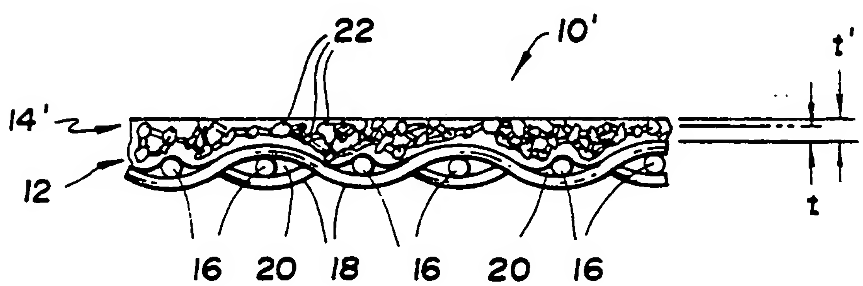

Fig. 4

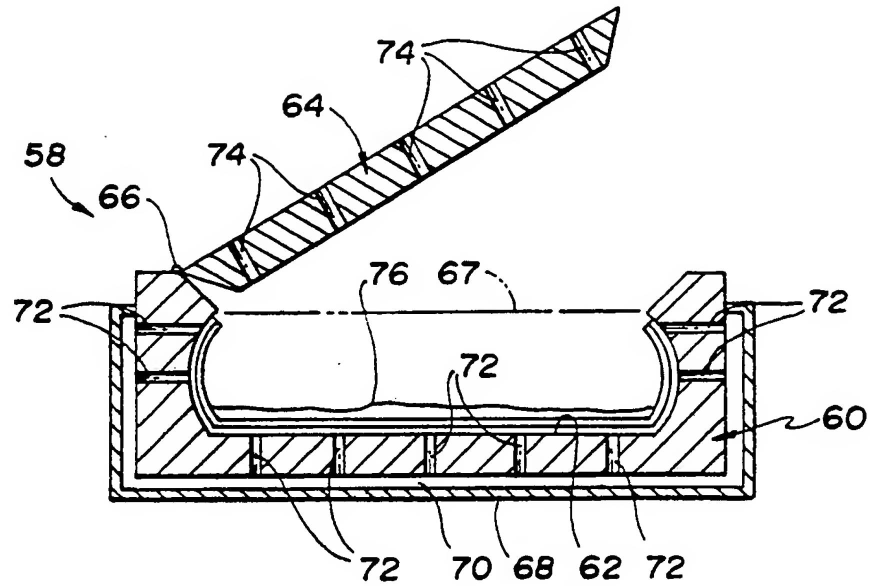

Fig. 5

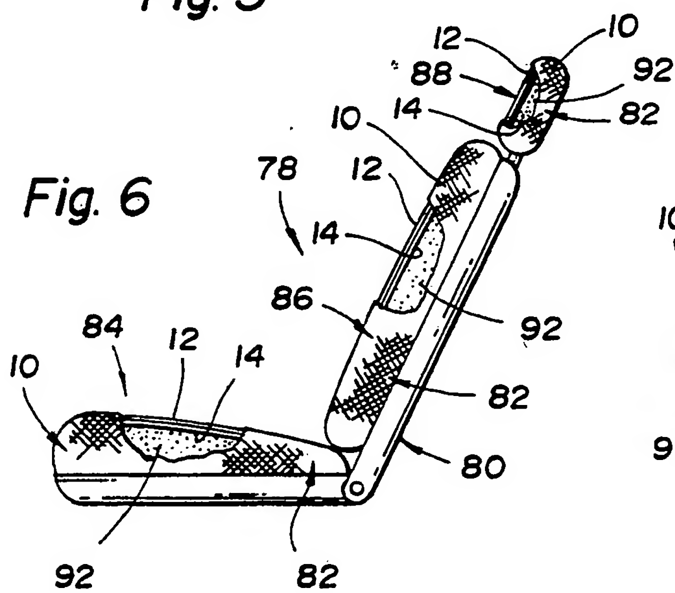

Fig. 6

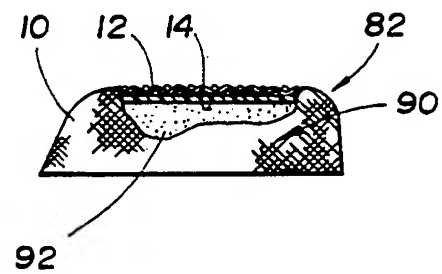

Fig. 7

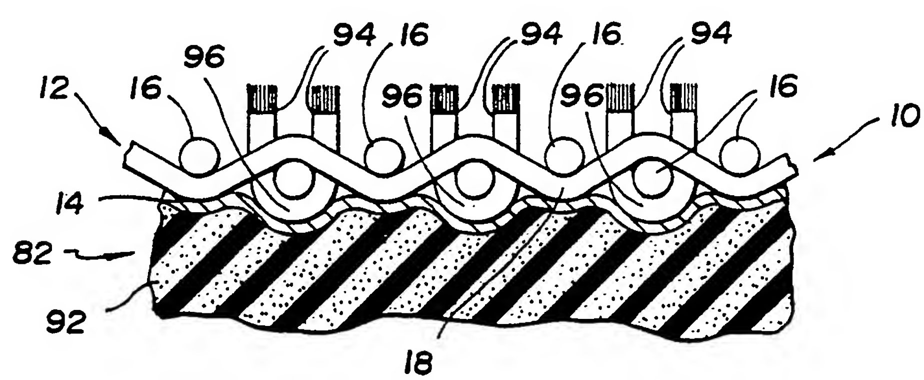

Fig. 8

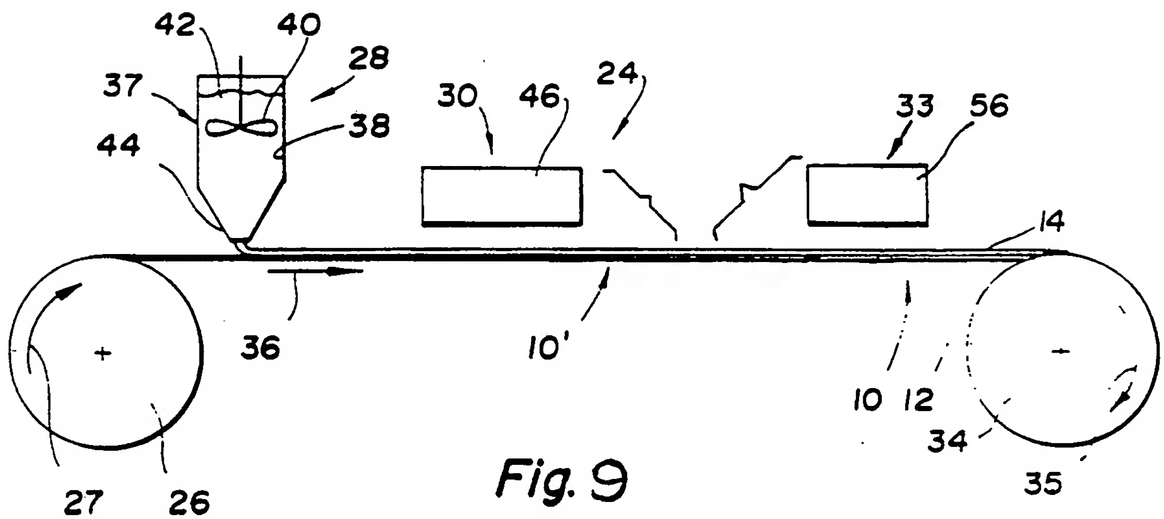

Fig. 9

INTERNATIONAL SEARCH REPORT

International Application No PCT/US91/09127

I. CLASSIFICATION OF SUBJECT MATTER

IPC (5): A47C 7/18,7/36,7/40,7/54; B05D 3/02,3/12,5/00;B32B 5/20,24,32
U.S.Cl.: 297/452,Dig.1,Dig.2; 427/244,365,369; 428/71,257,304.4

II. FIELDS SEARCHED

Minimum Documentation Searched

Classification System	Classification Symbols
U.S.	297/452,Dig.1,Dig.2; 5/482; 427/244,365,369,373; 428/72,257,304.4

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched

III. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	US, A, 3,713,868 (GORDON ET AL.) 30 January 1973 See entire document.	
A	US, A, 4,377,609 (BARTOLI ET AL.) 22 March 1983 See entire document.	
A	US, A, 4,439,473 (LIPPMAN) 27 March 1984 See entire document.	
A	US, A, 4,544,598 (MEILLER ET AL.) 01 October 1985 See entire document.	
A,E	US, A, 5,096,760 (THARY) 17 March 1992 See entire document.	
A	DE, A, 2,124,627 (WOOG ET AL.)	

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
08 April 1992	01 MAY 1992

International Searching Authority	Signature of Authorized Officer
ISA/US	Evan A. Lawrence